



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/603,135

06/23/2003

Roy T. Hashimoto

SSR-001-2

9917

34036 7590 09/13/2007
Silicon Valley Patent Group LLP
18805 Cox Avenue
Suite 220
Saratoga, CA 95070

EXAMINER

LIEW, ALEX KOK SOON

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

09/13/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/603,135

Applicant(s)

HASHIMOTO, ROY T.

Examiner

Alex Liew

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-23, 27, 28, 30-36, 40, 41 and 43-45 is/are pending in the application.
- 4a) Of the above claim(s) 1-19 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23, 27, 28, 30-32, 36, 40, 41 and 43-45 is/are allowed.
- 6) ☒ Claim(s) 20-22 and 33-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

Art Unit: 2624

The amendment filed on July 16, 2007 is entered and made of record.

Response to Applicant's Arguments

On page 10, the applicant stated:

Claim 20 is amended to include the limitation "locating the primary region" to further distinguish Claim 20 from the teachings of Kosaka. Specifically, Applicants respectfully submit that the teachings of Kosaka are fundamentally different from Claim 20.

Specifically, Kosaka teaches a "method for estimating the position and orientation of an object when at least four code markers can be identified." and "a case where at least three code markers can be identified".(Kosaka Col. 5, lines 17-22).

The examiner agrees. However, in the examiner new search, the examiner found Wakashiro (US pat no 6,901,161). Wakashiro discloses locating the primary region (see column 8, lines 21 to 24, the primary region is the area within the three main reference points). One skilled in the art would include locating the primary region because to select an origin from other point markers, so a coordinate can be assign to each of the marker points throughout the object in the image, which improves three-dimensional object determination.

The examiner will make a new rejection incorporating the new reference Wakashiro.

Allowable Claims

Claims 23, 27, 28, 30 – 32, 36, 40, 41 and 43 – 45 are allowable.

With regards to claim 23, the examiner cannot find any applicable prior art and suggestion disclosing adding a new planar group to the set of planar groups when a current 5D pose does not fit any planar group of the set of planar groups in combination with the rest of the limitations in claims 23.

With regards to claim 30, the examiner cannot find any applicable prior art and suggestion disclosing assigning a cross product of the first direction with a plane normal as a second direction of the multiple fiducial patterns in combination with the rest of the limitations of claims 30.

With regards to claim 36, see the rationale for claim 23.

With regards to claim 43, see the rationale for claim 30.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 20 – 22 and 33 – 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka (US pat no 6,724,930) in view of Wakashiro (US pat no 6,901,161).

With regards to claim 20, Kosaka discloses a method of pose estimation (in the specification the inventor described pose estimation is estimating the position and orientation of an object – page 67) using primary region representing a circular main fiducial and a second region representing an auxiliary fiducial (see fig 3 to 5– all the code markers shown has center circular marker, which is read as the main fiducial and anything outside of that circular marker in the middle are read as second region), the method comprising

calculating a plurality of moments of the primary region (see col. 8 lines 15 – 18 – the first and second moments are calculated in regions 1 of fig 7C),

characterizing the primary region as an ellipse based on the moments of the primary region (see col. 8 lines 29 – 31 – candidate marker regions are tested whether it is an marker region based on a threshold),

calculating a plurality of parameters for a 5D (five degrees of freedom) pose based on the ellipse (see col. 11 lines 5 – 39 – the coordinates of the markers in space represents the first three degrees, x_i , y_i and z_i , and the image positions of the markers are the last two degrees, u_i and v_i , expression 9 are distance between the makers to the camera d_i and D_i – the markers used are circular markers, but will be shaped close to an elliptical markers if see from an angle with respect to the object being observed –

Art Unit: 2624

then the positions of the markers are calculated using expression 9 – u and v are calculated using expression 6 – 1) and

calculating a 6D pose using the 5D pose and the auxiliary fiducial (see col. 13 lines 22 – 37 – there are six pose parameters which represents three rotational components and three translational components – to calculate the homogeneous matrix which represents the six dimensional pose of the object the position of the markers are need, col. 9 lines 8 – 13 – the makers used here are circular as shown in fig 3 to 5 having a main and second region).

Kosaka does not disclose locating the primary region.

Wakashiro discloses locating the primary region (see column 8, lines 21 to 24, the primary region is the area within the three main reference points). One skilled in the art would include locating the primary region because to select an origin from other point markers, so a coordinate can be assign to each of the marker points throughout the object in the image, which improves three-dimensional object determination.

With regards to claim 21, Kosaka discloses a method of claim 20, wherein the calculating a 6D pose using the 5D pose and the auxiliary fiducial comprises calculating a centroid of the auxiliary fiducial (see col. 9 lines 5 – 8 – the center of the marker is the centroid where it represents the position of the marker, the position of the markers are use to calculate the six dimensional pose).

Art Unit: 2624

With regards to claim 22, Kosaka discloses a method of claim 20, wherein the calculating a 6D pose using the 5D and the auxiliary fiducial comprises calculating the orientation of the auxiliary fiducial (see col. 13 lines 23 – 27 – once the orientation of the object is obtain, the orientation of the marker are also obtain because, the markers are placed on the object).

With regards to claim 33, see the rationale and rejection for claim 20.

With regards to claim 34, see the rationale and rejection for claim 21.

With regards to claim 35, see the rationale and rejection for claim 22.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2624

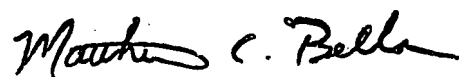
extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Liew whose telephone number is (571)272-8623. The examiner can normally be reached on 9:30AM - 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alex Liew
AU2624
9/6/07



MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600